

SEQUENCE LISTING

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<120> NPC1L1 (NPC3) AND METHODS OF USE THEREOF

<130> JB01603-K1-US

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<141> 2003-08-22

<150> 60/397,442

<151> 2002-07-19

<150> 10/621,758

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<160> 50

<170> PatentIn version 3.1

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Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu		
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Val Thr Gly Glu His Leu Ala Leu Leu Gln Arg Ile Cys Pro Arg Leu		
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Tyr Asn Gly Pro Asn Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu		
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Cys Pro Ala Cys Ser Asp Asn Phe Val Ser Leu His Cys His Asn Thr		
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp		
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Arg	Cys	Pro	Lys	Gly	Gly	Leu	Ala	Ala	Tyr	Arg	Thr	Ser	Val	Asn	
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Tyr	Leu	Leu	Leu	Gly	Leu	Asp	Met	Cys	Ser	Gly	Ile	Leu	Asn	Leu	
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Cys Asn Ile Asn Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp
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Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val
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900 905 910

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Thr Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg
1175 1180 1185

Ser Phe Ala Val Ser Thr Lys Pro Thr Arg Leu Glu Arg Ala Lys
1190 1195 1200

Asp Ala Thr Val Phe Met Gly Ser Ala Val Phe Ala Gly Val Ala
1205 1210 1215

Met Thr Asn Phe Pro Gly Ile Leu Ile Leu Gly Phe Ala Gln Ala
1220 1225 1230

Gln Leu Ile Gln Ile Phe Phe Phe Arg Leu Asn Leu Leu Ile Thr
1235 1240 1245

Leu Leu Gly Leu Leu His Gly Leu Val Phe Leu Pro Val Val Leu
1250 1255 1260

Ser Tyr Leu Gly Pro Asp Val Asn Gln Ala Leu Val Gln Glu Glu
1265 1270 1275

Lys Leu Ala Ser Glu Ala Ala Val Ala Pro Glu Pro Ser Cys Pro
1280 1285 1290

Gln Tyr Pro Ser Pro Ala Asp Ala Asp Ala Asn Val Asn Tyr Gly
1295 1300 1305

Phe Ala Pro Glu Leu Ala His Gly Ala Asn Ala Ala Arg Ser Ser
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Leu Pro Lys Ser Asp Gln Lys Phe
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cgc ttg gcc cag agt gag cct tac aca acc atc cac cag cct ggc tac 96
Arg Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr
20 25 30

tgc gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc 144
Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser
35 40 45

ctc atg aca ctc tcc aac gtg tcc tgc ctg tcc aac acg ccg gcc cgc 192
Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg
50 55 60

aag atc aca ggt gat cac ctg atc cta tta cag aag atc tgc ccc cgc Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg 65 70 75 80	240
ctc tac acc ggc ccc aac acc caa gcc tgc tgc tcc gcc aag cag ctg Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu 85 90 95	288
gta tca ctg gaa gcg agt ctg tcg atc acc aag gcc ctc ctc acc cgc Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg 100 105 110	336
tgc cca gcc tgc tct gac aat ttt gtg aac ctg cac tgc cac aac acg Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr 115 120 125	384
tgc agc ccc aat cag agc ctc ttc atc aat gtg acc cgc gtg gcc cag Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln 130 135 140	432
cta ggg gct gga caa ctc cca gct gtg gtg gcc tat gag gcc ttc tac Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr 145 150 155 160	480
cag cat agc ttt gcc gag cag agc tat gac tcc tgc agc cgt gtg cgc Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg 165 170 175	528
gtc cct gca gct gcc acg ctg gct gtg ggc acc atg tgt ggc gtg tat Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr 180 185 190	576
ggc tct gcc ctt tgc aat gcc cag cgc tgg ctc aac ttc cag gga gac Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp 195 200 205	624
aca ggc aat ggt ctg gcc cca ctg gac atc acc ttc cac ctc ttg gag Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu 210 215 220	672
cct ggc cag gcc gtg ggg agt ggg att cag cct ctg aat gag ggg gtt Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val 225 230 235 240	720
gca cgt tgc aat gag tcc caa ggt gac gac gtg gcg acc tgc tcc tgc Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys 245 250 255	768
caa gac tgt gca tcc tgt cct gcc ata gcc cgc ccc cag gcc ctc Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu 260 265 270	816
gac tcc acc ttc tac ctg ggc cag atg ccg ggc agt ctg gtc ctc atc Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile 275 280 285	864
atc atc ctc tgc tct gtc ttc gct gtg gtc acc atc ctg ctt gtg gga Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly 290 295 300	912

ttc cgt gtg gcc ccc gcc agg gac aaa agc aag atg gtg gac ccc aag Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys 305 310 315 320	960
aag ggc acc agc ctc tct gac aag ctc agc ttc tcc acc cac acc ctc Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu 325 330 335	1008
ctt ggc cag ttc cag ggc tgg ggc acg tgg gtg gct tcg tgg cct Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro 340 345 350	1056
ctg acc atc ttg gtg cta tct gtc atc ccg gtg gtg gcc ttg gca gcg Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala 355 360 365	1104
ggc ctg gtc ttt aca gaa ctc act acg gac ccc gtg gag ctg tgg tcg Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser 370 375 380	1152
gcc ccc aac agc caa gcc cgg agt gag aaa gct ttc cat gac cag cat Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His 385 390 395 400	1200
ttc ggc ccc ttc ttc cga acc aac cag gtg atc ctg acg gct cct aac Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn 405 410 415	1248
cgg tcc agc tac agg tat gac tct ctg ctg ggg ccc aag aac ttc Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe 420 425 430	1296
agc gga atc ctg gac ttg ctg ctg gag ctg cta gag ctg cag Ser Gly Ile Leu Asp Leu Asp Leu Leu Glu Leu Glu Leu Gln 435 440 445	1344
gag agg ctg cgg cac ctc cag gta tgg tcg ccc gaa gca cag cgc aac Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn 450 455 460	1392
atc tcc ctg cag gac atc tgc tac gcc ccc ctc aat ccg gac aat acc Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr 465 470 475 480	1440
agt ctc tac gac tgc tgc atc aac agc ctc ctg cag tat ttc cag aac Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn 485 490 495	1488
aac cgc acg ctc ctg ctc aca gcc aac cag aca ctg atg ggg cag Asn Arg Thr Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln 500 505 510	1536
acc tcc caa gtc gac tgg aag gac cat ttt ctg tac tgt gcc aat gcc Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala 515 520 525	1584
ccg ctc acc ttc aag gat ggc aca gcc ctg gcc ctg agc tgc atg gct Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala 530 535 540	1632
gac tac ggg gcc cct gtc ttc ccc ttc ctt gcc att ggg ggg tac aaa	1680

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys				
545	550	555	560	
gga aag gac tat tct gag gca gag gcc ctg atc atg acg ttc tcc ctc				1728
Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu				
565	570	575		
aac aat tac cct gcc ggg gac ccc cgt ctg gcc cag gcc aag ctg tgg				1776
Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp				
580	585	590		
gag gag gcc ttc tta gag gaa atg cga gcc ttc cag cgt cgg atg gct				1824
Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala				
595	600	605		
ggc atg ttc cag gtc acg ttc acg gct gag cgc tct ctg gaa gac gag				1872
Gly Met Phe Gln Val Thr Phe Thr Ala Glu Arg Ser Leu Glu Asp Glu				
610	615	620		
atc aat cgc acc aca gct gaa gac ctg ccc atc ttt gcc acc agc tac				1920
Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr				
625	630	635	640	
att gtc ata ttc ctg tac atc tct ctg gcc ctg ggc agc tat tcc agc				1968
Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser				
645	650	655		
tgg agc cga gtg atg gtg gac tcc aag gcc acg ctg ggc ctc ggc ggg				2016
Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly				
660	665	670		
gtg gcc gtg gtc ctg gga gca gtc atg gct gcc atg ggc ttc ttc tcc				2064
Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser				
675	680	685		
tac ttg ggt atc cgc tcc tcc ctg gtc atc ctg caa gtg gtt cct ttc				2112
Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe				
690	695	700		
ctg gtg ctg tcc gtg ggg gct gat aac atc ttc atc ttt gtt ctc gag				2160
Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu				
705	710	715	720	
tac cag agg ctg ccc cgg agg cct ggg gag cca cga gag gtc cac att				2208
Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile				
725	730	735		
ggg cga gcc cta ggc agg gtg gct ccc agc atg ctg ttg tgc agc ctc				2256
Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu				
740	745	750		
tct gag gcc atc tgc ttc cta ggg gcc ctg acc ccc atg cca gct				2304
Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala				
755	760	765		
gtg cgg acc ttt gcc ctg acc tct ggc ctt gca gtg atc ctt gac ttc				2352
Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe				
770	775	780		
ctc ctg cag atg tca gcc ttt gtg gcc ctg ctc tcc ctg gac agc aag				2400
Leu Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys				

785	790	795	800	
agg cag gag gcc tcc cg	ttg gac gtc tgc tgc tgt	gtc aag ccc cag		2448
Arg Gln Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln				
805	810	815		
gag ctg ccc ccg cct ggc cag gga gag ggg ctc ctg ctt ggc ttc ttc				2496
Glu Leu Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe				
820	825	830		
caa aag gct tat gcc ccc ttc ctg ctg cac tgg atc act cga ggt gtt				2544
Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val				
835	840	845		
gtg ctg ctg ctg ttt ctc gcc ctg ttc gga gtg agc ctc tac tcc atg				2592
Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met				
850	855	860		
tgc cac atc agc gtg gga ctg gac cag gag ctg gcc ctg ccc aag gac				2640
Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp				
865	870	875	880	
tcg tac ctg ctt gac tat ttc ctc ttt ctg aac cgc tac ttc gag gtg				2688
Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val				
885	890	895		
ggg gcc ccg gtg tac ttt gtt acc acc ttg ggc tac aac ttc tcc agc				2736
Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser				
900	905	910		
gag gct ggg atg aat gcc atc tgc tcc agt gca ggc tgc aac aac ttc				2784
Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe				
915	920	925		
tcc ttc acc cag aag atc cag tat gcc aca gag ttc cct gag cag tct				2832
Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser				
930	935	940		
tac ctg gcc atc cct gcc tcc tcc tgg gtg gat gac ttc att gac tgg				2880
Tyr Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp				
945	950	955	960	
ctg acc ccg tcc tcc tgc tgc cgc ctt tat ata tct ggc ccc aat aag				2928
Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys				
965	970	975		
gac aag ttc tgc ccc tcg acc gtc aac tct ctg aac tgc cta aag aac				2976
Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn				
980	985	990		
tgc atg agc atc acg atg ggc tct gtg agg ccc tcg gtg gag cag ttc				3024
Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe				
995	1000	1005		
cat aag tat ctt ccc tgg ttc ctg aac gac cgg ccc aac atc aaa				3069
His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys				
1010	1015	1020		
tgt ccc aaa ggc ggc ctg gca gca tac agc acc tct gtg aac ttg				3114
Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu				
1025	1030	1035		

act tca	gat ggc cag gtt tta	gcc tcc agg ttc atg	gcc tat cac	3159
Thr Ser	Asp Gly Gln Val Leu	Ala Ser Arg Phe Met	Ala Tyr His	
1040	1045	1050		
aag ccc	ctg aaa aac tca cag	gat tac aca gaa gct	ctg cgg gca	3204
Lys Pro	Leu Lys Asn Ser Gln	Asp Tyr Thr Glu Ala	Leu Arg Ala	
1055	1060	1065		
gct cga	gag ctg gca gcc aac	atc act gct gac ctg	cgg aaa gtg	3249
Ala Arg	Glu Leu Ala Ala Asn	Ile Thr Ala Asp Leu	Arg Lys Val	
1070	1075	1080		
cct gga	aca gac ccg gct ttt	gag gtc ttc ccc tac	acg atc acc	3294
Pro Gly	Thr Asp Pro Ala Phe	Glu Val Phe Pro Tyr	Thr Ile Thr	
1085	1090	1095		
aat gtg	ttt tat gag cag tac	ctg acc atc ctc cct	gag ggg ctc	3339
Asn Val	Phe Tyr Glu Gln Tyr	Leu Thr Ile Leu Pro	Glu Gly Leu	
1100	1105	1110		
ttc atg	ctc agc ctc tgc ctt	gtg ccc acc ttc gct	gtc tcc tgc	3384
Phe Met	Leu Ser Leu Cys Leu	Val Pro Thr Phe Ala	Val Ser Cys	
1115	1120	1125		
ctc ctg	ctg ggc ctg gac ctg	cgc tcc ggc ctc ctc	aac ctg ctc	3429
Leu Leu	Leu Gly Leu Asp Leu	Arg Ser Gly Leu	Asn Leu Leu	
1130	1135	1140		
tcc att	gtc atg atc ctc gtg	gac act gtc ggc ttc	atg gcc ctg	3474
Ser Ile	Val Met Ile Leu Val	Asp Thr Val Gly Phe	Met Ala Leu	
1145	1150	1155		
tgg gac	atc agt tac aat gct	gtg tcc ctc atc aac	ctg gtc tcg	3519
Trp Asp	Ile Ser Tyr Asn Ala	Val Ser Leu Ile Asn	Leu Val Ser	
1160	1165	1170		
gcg gtg	ggc atg tct gtg gag	ttt gtg tcc cac att	acc cgc tcc	3564
Ala Val	Gly Met Ser Val Glu	Phe Val Ser His Ile	Thr Arg Ser	
1175	1180	1185		
ttt gcc	atc agc acc aag ccc	acc tgg ctg gag agg	gcc aaa gag	3609
Phe Ala	Ile Ser Thr Lys Pro	Thr Trp Leu Glu Arg	Ala Lys Glu	
1190	1195	1200		
gcc acc	atc tct atg gga agt	gcg gtg ttt gca ggt	gtg gcc atg	3654
Ala Thr	Ile Ser Met Gly Ser	Ala Val Phe Ala Gly	Val Ala Met	
1205	1210	1215		
acc aac	ctg cct ggc atc ctt	gtc ctg ggc ctc gcc	aag gcc cag	3699
Thr Asn	Leu Pro Gly Ile Leu	Val Leu Gly Leu Ala	Lys Ala Gln	
1220	1225	1230		
ctc att	cag atc ttc ttc ttc	cgc ctc aac ctc ctg	atc act ctg	3744
Leu Ile	Gln Ile Phe Phe Phe	Arg Leu Asn Leu Leu	Ile Thr Leu	
1235	1240	1245		
ctg ggc	ctg ctg cat ggc ttg	gtc ttc ctg ccc gtc	atc ctc agc	3789
Leu Gly	Leu Leu His Gly Leu	Val Phe Leu Pro Val	Ile Leu Ser	
1250	1255	1260		

tac	gtg	ggg	cct	gac	gtt	aac	ccg	gct	ctg	gca	ctg	gag	cag	aag	3834
Tyr	Val	Gly	Pro	Asp	Val	Asn	Pro	Ala	Leu	Ala	Leu	Glu	Gln	Lys	
1265					1270						1275				
cgg	gct	gag	gag	gcg	gtg	gca	gca	gtc	atg	gtg	gcc	tct	tgc	cca	3879
Arg	Ala	Glu	Glu	Ala	Val	Ala	Ala	Val	Met	Val	Ala	Ser	Cys	Pro	
1280					1285						1290				
aat	cac	ccc	tcc	cga	gtc	tcc	aca	gct	gac	aac	atc	tat	gtc	aac	3924
Asn	His	Pro	Ser	Arg	Val	Ser	Thr	Ala	Asp	Asn	Ile	Tyr	Val	Asn	
1295						1300					1305				
cac	agc	ttt	gaa	ggt	tct	atc	aaa	ggt	gct	ggt	gcc	atc	agc	aac	3969
His	Ser	Phe	Glu	Gly	Ser	Ile	Lys	Gly	Ala	Gly	Ala	Ile	Ser	Asn	
1310						1315					1320				
ttc	ttg	ccc	aac	aat	ggg	cgg	cag	ttc	tga						3999
Phe	Leu	Pro	Asn	Asn	Gly	Arg									
1325						1330									

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Arg	Leu	Ala	Gln	Ser	Glu	Pro	Tyr	Thr	Thr	Ile	His	Gln	Pro	Gly	Tyr
					20			25			30				

Cys	Ala	Phe	Tyr	Asp	Glu	Cys	Gly	Lys	Asn	Pro	Glu	Leu	Ser	Gly	Ser
						35		40			45				

Leu	Met	Thr	Leu	Ser	Asn	Val	Ser	Cys	Leu	Ser	Asn	Thr	Pro	Ala	Arg
	50					55					60				

Lys	Ile	Thr	Gly	Asp	His	Leu	Ile	Leu	Leu	Gln	Lys	Ile	Cys	Pro	Arg
65						70			75		80				

Leu	Tyr	Thr	Gly	Pro	Asn	Thr	Gln	Ala	Cys	Cys	Ser	Ala	Lys	Gln	Leu
						85			90			95			

Val	Ser	Leu	Glu	Ala	Ser	Leu	Ser	Ile	Thr	Lys	Ala	Leu	Leu	Thr	Arg
						100			105			110			

Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr
115 120 125

Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln
130 135 140

Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr
145 150 155 160

Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg
165 170 175

Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr
180 185 190

Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp
195 200 205

Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu
210 215 220

Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val
225 230 235 240

Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys
245 250 255

Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu
260 265 270

Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile
275 280 285

Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly
290 295 300

Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys
305 310 315 320

Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu
325 330 335

Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro
340 345 350

Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala

355

360

365

Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser
 370 375 380

Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His
 385 390 395 400

Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn
 405 410 415

Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe
 420 425 430

Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln
 435 440 445

Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn
 450 455 460

Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr
 465 470 475 480

Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn
 485 490 495

Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln
 500 505 510

Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala
 515 520 525

Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala
 530 535 540

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys
 545 550 555 560

Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu
 565 570 575

Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp
 580 585 590

Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala
 595 600 605

Gly Met Phe Gln Val Thr Phe Thr Ala Glu Arg Ser Leu Glu Asp Glu
610 615 620

Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr
625 630 635 640

Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser
645 650 655

Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly
660 665 670

Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser
675 680 685

Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe
690 695 700

Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu
705 710 715 720

Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile
725 730 735

Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu
740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala
755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe
770 775 780

Leu Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys
785 790 795 800

Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln
805 810 815

Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe
820 825 830

Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val
835 840 845

Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met
850 855 860

Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp
865 870 875 880

Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val
885 890 895

Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser
900 905 910

Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe
915 920 925

Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser
930 935 940

Tyr Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp
945 950 955 960

Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys
965 970 975

Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn
980 985 990

Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe
995 1000 1005

His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys
1010 1015 1020

Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu
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Lys Pro Leu Lys Asn Ser Gln Asp Tyr Thr Glu Ala Leu Arg Ala
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Ala Arg Glu Leu Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys Val
1070 1075 1080

Pro Gly Thr Asp Pro Ala Phe Glu Val Phe Pro Tyr Thr Ile Thr
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Asn Val Phe Tyr Glu Gln Tyr Leu Thr Ile Leu Pro Glu Gly Leu
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Phe Met Leu Ser Leu Cys Leu Val Pro Thr Phe Ala Val Ser Cys
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Ser Ile Val Met Ile Leu Val Asp Thr Val Gly Phe Met Ala Leu
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Trp Asp Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val Ser
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Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg Ser
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Leu Gly Leu Leu His Gly Leu Val Phe Leu Pro Val Ile Leu Ser
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Tyr Val Gly Pro Asp Val Asn Pro Ala Leu Ala Leu Glu Gln Lys
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Arg Ala Glu Glu Ala Val Ala Ala Val Met Val Ala Ser Cys Pro
1280 1285 1290

Asn His Pro Ser Arg Val Ser Thr Ala Asp Asn Ile Tyr Val Asn
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His Ser Phe Glu Gly Ser Ile Lys Gly Ala Gly Ala Ile Ser Asn

1310

1315

1320

Phe Leu Pro Asn Asn Gly Arg Gln Phe
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<211> 885

<212> DNA

<213> Rattus sp.

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<211> 458

<212> DNA

<213> Rattus sp.

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<212> DNA

<213> Rattus sp.

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<211> 3124

<212> DNA

<213> Rattus sp.

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<211> 4484

<212> DNA

<213> Rattus sp.

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1 5 10 15		
tcg gcc cag ggt gag ctc tac aca ccc act cac aaa gct ggc ttc tgc		96
Ser Ala Gln Gly Glu Leu Tyr Thr Pro Thr His Lys Ala Gly Phe Cys		
20 25 30		
acc ttt tat gaa gag tgt ggg aag aac cca gag ctt tct gga ggc ctc		144
Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu		
35 40 45		
aca tca cta tcc aat atc tcc tgc ttg tct aat acc cca gcc cgc cat		192
Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His		
50 55 60		
gtc aca ggt gac cac ctg gct ctt ctc cag cgc gtc tgt ccc cgc cta		240
Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu		
65 70 75 80		
tac aat ggc ccc aat gac acc tat gcc tgt tgc tct acc aag cag ctg		288
Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu		
85 90 95		
gtg tca tta gac agt agc ctg tct atc acc aag gcc ctc ctt aca cgc		336
Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg		
100 105 110		
tgc ccg gca tgc tct gaa aat ttt gtg agc ata cac tgt cat aat acc		384
Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr		
115 120 125		
tgc agc cct gac cag agc ctc ttc atc aat gtt act cgc gtg gtt cag		432
Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln		
130 135 140		
cgg gac cct gga cag ctt cct gct gtg gtg gcc tat gag gcc ttt tat		480
Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr		
145 150 155 160		
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Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg		

165	170	175	
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ggc tct gcc ctc tgc aat gct cag cgc tgg ctc aac ttc caa gga gac Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp 195	200	205	624
aca ggg aat ggc ctg gct ccg ctg gac atc acc ttc cac ctc ttg gag Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu 210	215	220	672
cct ggc cag gcc ctg gca gat ggg atg aag cca ctg gat ggg aag atc Pro Gly Gln Ala Leu Ala Asp Gly Met Lys Pro Leu Asp Gly Lys Ile 225	230	235	720
aca ccc tgc aat gag tcc cag ggt gaa gac tcg gca gcc tgt tcc tgc Thr Pro Cys Asn Glu Ser Gln Gly Glu Asp Ser Ala Ala Cys Ser Cys 245	250	255	768
cag gac tgt gca gca tcc tgc cct gtc atc cct ccg ccc ccg gcc ctg Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Ala Leu 260	265	270	816
cgc cct tct ttc tac atg ggt cga atg cca ggc tgg ctg gct ctc atc Arg Pro Ser Phe Tyr Met Gly Arg Met Pro Gly Trp Leu Ala Leu Ile 275	280	285	864
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ctc cga gtg gct tcc aac agg aac aag aac aca gca ggc tcc cag Leu Arg Val Ala Ser Asn Arg Asn Lys Asn Lys Thr Ala Gly Ser Gln 305	310	315	960
gaa gcc ccc aac ctc cct cgt aag cgc aga ttc tca cct cac act gtc Glu Ala Pro Asn Leu Pro Arg Lys Arg Arg Phe Ser Pro His Thr Val 325	330	335	1008
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agt ggg atc cta tcc ctg gac ttg ctg cag gag ctg ttg gag cta cag Ser Gly Ile Leu Ser Leu Asp Leu Leu Gln Glu Leu Leu Glu Leu Gln 435 440 445	1344
gag aga ctt cga cac ctg caa gtg tgg tcc cat gag gca cag cgc aac Glu Arg Leu Arg His Leu Gln Val Trp Ser His Glu Ala Gln Arg Asn 450 455 460	1392
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aac cac aca ctc ctg ctg ctc aca gcc aat cag act ctg aat ggc cag Asn His Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln 500 505 510	1536
acc tcc ctg gtg gac tgg aag gac cat ttc ctc tac tgt gcc aat gcc Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala 515 520 525	1584
cct ctc acg tac aaa gat ggc aca gcc ctg gcc ctg agc tgc ata gct Pro Leu Thr Tyr Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Ile Ala 530 535 540	1632
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tac cag agg ctg cct agg atg ccc ggg gag cag cga gag gct cac att Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile 725 730 735	2208
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tct gag gcc atc tgc ttc ttt cta ggg gcc ctg acc tcc atg cca gct Ser Glu Ala Ile Cys Phe Leu Gly Ala Leu Thr Ser Met Pro Ala 755 760 765	2304
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Glu	Ala	Gly	Met	Asn	Ala	Ile	Cys	Ser	Ser	Ala	Gly	Cys	Glu	Ser	Phe
915						920					925				
tcc	cta	acc	cag	aaa	atc	cag	tat	gcc	agt	gaa	ttc	cct	aat	cag	tct
Ser	Leu	Thr	Gln	Lys	Ile	Gln	Tyr	Ala	Ser	Glu	Phe	Pro	Asn	Gln	Ser
930					935					940					
tat	gtg	gct	att	gct	gca	tcc	tcc	tgg	gta	gat	gac	ttc	atc	gac	tgg
Tyr	Val	Ala	Ile	Ala	Ala	Ser	Ser	Trp	Val	Asp	Asp	Phe	Ile	Asp	Trp
945					950				955			960			
ctg	acc	cca	tcc	tcc	tcc	tgc	tgc	att	tat	acc	cgt	ggc	ccc	cat	
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965					970				975						
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Lys	Asp	Glu	Phe	Cys	Pro	Ser	Thr	Asp	Thr	Ser	Phe	Asn	Cys	Leu	Lys
980					985				990						
aac	tgc	atg	aac	cgc	act	ctg	ggt	ccc	gtg	aga	ccc	aca	aca	gaa	cag
Asn	Cys	Met	Asn	Arg	Thr	Leu	Gly	Pro	Val	Arg	Pro	Thr	Thr	Glu	Gln
995					1000				1005						
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1040					1045				1050						
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His	Lys	Pro	Leu	Arg	Asn	Ser	Gln	Asp	Phe	Thr	Glu	Ala	Leu	Arg	
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Ile	Phe	Thr	Leu	Ala	Leu	Cys	Phe	Val	Pro	Thr	Phe	Val	Val	Cys	
1115					1120				1125						
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Tyr	Leu	Leu	Leu	Gly	Leu	Asp	Ile	Arg	Ser	Gly	Ile	Leu	Asn	Leu	

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Leu Ser Ile Ile Met Ile Leu	Val Asp Thr Ile Gly	Leu Met Ala	
1145	1150	1155	
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Val Trp Gly Ile Ser Tyr Asn	Ala Val Ser Leu Ile	Asn Leu Val	
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Thr Ala Val Gly Met Ser Val	Glu Phe Val Ser His	Ile Thr Arg	
1175	1180	1185	
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Ser Phe Ala Val Ser Thr Lys	Pro Thr Arg Leu Glu	Arg Ala Lys	
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Asp Ala Thr Ile Phe Met Gly	Ser Ala Val Phe Ala	Gly Val Ala	
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Met Thr Asn Phe Pro Gly Ile	Leu Ile Leu Gly Phe	Ala Gln Ala	
1220	1225	1230	
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Gln Leu Ile Gln Ile Phe Phe	Phe Arg Leu Asn Leu	Leu Ile Thr	
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Leu Leu Gly Leu Leu His Gly	Leu Val Phe Leu Pro	Val Val Leu	
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Ser Tyr Leu Gly Pro Asp Val	Asn Gln Ala Leu Val	Leu Glu Glu	
1265	1270	1275	
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Lys Leu Ala Thr Glu Ala Ala	Met Val Ser Glu Pro	Ser Cys Pro	
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Gln Tyr Pro Phe Pro Ala Asp	Ala Asn Thr Ser Asp	Tyr Val Asn	
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Tyr Gly Phe Asn Pro Glu Phe	Ile Pro Glu Ile Asn	Ala Ala Ser	
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Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu
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Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His
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Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu
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Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr
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Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln
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145 150 155 160

Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg
165 170 175

Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp
195 200 205

Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu
210 215 220

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	230		235												
Thr	Pro	Cys	Asn	Glu	Ser	Gln	Gly	Glu	Asp	Ser	Ala	Ala	Cys	Ser	Cys
	245														255
	250														
Gln	Asp	Cys	Ala	Ala	Ser	Cys	Pro	Val	Ile	Pro	Pro	Pro	Pro	Ala	Leu
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Arg	Pro	Ser	Phe	Tyr	Met	Gly	Arg	Met	Pro	Gly	Trp	Leu	Ala	Leu	Ile
	275														285
	280														
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	290														300
	295														
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	310														
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	325														
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	340														
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705

710

715

720

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Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Ser Met Pro Ala
755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Phe Asp Phe
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Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val
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Ser Leu Thr Gln Lys Ile Gln Tyr Ala Ser Glu Phe Pro Asn Gln Ser
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945 950 955 960

Leu Thr Pro Ser Ser Ser Cys Cys Arg Ile Tyr Thr Arg Gly Pro His
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Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys
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 Ala Glu Ala Gly Leu Arg Gly Trp Leu Leu Trp Ala Leu Leu Leu Arg
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ttg gcc cag agt gag cct tac aca acc atc cac cag cct ggc tac tgc 155
 Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr Cys
 20 25 30

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gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc ctc      203
Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser Leu
35          40          45

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 Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu Val
 85 90 95

tca ctg gaa gcg agt ctg tcg atc acc aag gcc ctc ctc acc cgc tgc	395
Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg Cys	
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Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr Cys
115          120          125
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Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln Leu
130           135           140           145
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tcc agc tac agg tat gac tct ctg ctg ggg ccc aag aac ttc agc Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe Ser 420 425 430	1355
gga atc ctg gac ctg gac ttg ctg ctg gag ctg cta gag ctg cag gag Gly Ile Leu Asp Leu Asp Leu Leu Glu Leu Glu Leu Gln Glu 435 440 445	1403
agg ctg cgg cac ctc cag gta tgg tcg ccc gaa gca cag cgc aac atc Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn Ile 450 455 460 465	1451
tcc ctg cag gac atc tgc tac gcc ccc ctc aat ccg gac aat acc agt Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr Ser 470 475 480	1499
ctc tac gac tgc tgc atc aac agc ctc ctg cag tat ttc cag aac aac Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn Asn 485 490 495	1547
cgc acg ctc ctg ctg ctc aca gcc aac cag aca ctg atg ggg cag acc Arg Thr Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln Thr 500 505 510	1595
tcc caa gtc gac tgg aag gac cat ttt ctg tac tgt gcc aat gcc ccg Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala Pro 515 520 525	1643
ctc acc ttc aag gat ggc aca gcc ctg gcc ctg agc tgc atg gct gac Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala Asp 530 535 540 545	1691
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Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr Ile			
630	635	640	
gtc ata ttc ctg tac atc tct ctg gcc ctg ggc agc tat tcc agc tgg			2027
Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser Trp			
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agc cga gtg atg gtg gac tcc aag gcc acg ctg ggc ctc ggc ggg gtg			2075
Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly Val			
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gcc gtg gtc ctg gga gca gtc atg gct gcc atg ggc ttc ttc tcc tac			2123
Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser Tyr			
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ttg ggt atc cgc tcc tcc ctg gtc atc ctg caa gtg gtt cct ttc ctg			2171
Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe Leu			
690	695	700	705
gtg ctg tcc gtg ggg gct gat aac atc ttc atc ttt gtt ctc gag tac			2219
Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu Tyr			
710	715	720	
cag agg ctg ccc cgg agg cct ggg gag cca cga gag gtc cac att ggg			2267
Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile Gly			
725	730	735	
cga gcc cta ggc agg gtg gct ccc agc atg ctg ttg tgc agc ctc tct			2315
Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu Ser			
740	745	750	
gag gcc atc tgc ttc ttc cta ggg gcc ctg acc ccc atg cca gct gtg			2363
Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala Val			
755	760	765	
cgg acc ttt gcc ctg acc tct ggc ctt gca gtg atc ctt gac ttc ctc			2411
Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe Leu			
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ctg cag atg tca gcc ttt gtg gcc ctg ctc tcc ctg gac agc aag agg			2459
Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys Arg			
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cag gag gcc tcc cgg ttg gac gtc tgc tgc tgt gtc aag ccc cag gag			2507
Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln Glu			
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ctg ccc ccg cct ggc cag gga gag ggg ctc ctg ctt ggc ttc ttc caa			2555
Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe Gln			
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Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val Val			
835	840	845	
ctg ctg ctg ttt ctc gcc ctg ttc gga gtg agc ctc tac tcc atg tgc			2651
Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met Cys			
850	855	860	865
cac atc agc gtg gga ctg gac cag gag ctg gcc ctg ccc aag gac tcg			2699
His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp Ser			

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tac ctg ctt gac tat ttc ctc ttt ctg aac cgc tac ttc gag gtg ggg Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val Gly	885	890	895	2747
gcc ccg gtg tac ttt gtt acc acc ttg ggc tac aac ttc tcc agc gag Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser Glu	900	905	910	2795
gct ggg atg aat gcc atc tgc tcc agt gca ggc tgc aac aac ttc tcc Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe Ser	915	920	925	2843
ttc acc cag aag atc cag tat gcc aca gag ttc cct gag cag tct tac Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser Tyr	930	935	940	2891
ctg gcc atc cct gcc tcc tcc tgg gtg gat gac ttc att gac tgg ctg Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp Leu	950	955	960	2939
acc ccg tcc tcc tgc tgc cgc ctt tat ata tct ggc ccc aat aag gac Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys Asp	965	970	975	2987
aag ttc tgc ccc tcg acc gtc aac tct ctg aac tgc cta aag aac tgc Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn Cys	980	985	990	3035
atg agc atc acg atg ggc tct gtg agg ccc tcg gtg gag cag ttc cat Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe His	995	1000	1005	3083
aag tat ctt ccc tgg ttc ctg aac gac cgg ccc aac atc aaa tgt Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys Cys	1010	1015	1020	3128
ccc aaa ggc ggc ctg gca gca tac agc acc tct gtg aac ttg act Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu Thr	1025	1030	1035	3173
tca gat ggc cag gtt tta gac aca gtt gcc att ctg tca ccc agg Ser Asp Gly Gln Val Leu Asp Thr Val Ala Ile Leu Ser Pro Arg	1040	1045	1050	3218
ctg gag tac agt ggc aca atc tcg gct cac tgc aac ctc tac ctc Leu Glu Tyr Ser Gly Thr Ile Ser Ala His Cys Asn Leu Tyr Leu	1055	1060	1065	3263
ctg gat tca gcc tcc agg ttc atg gcc tat cac aag ccc ctg aaa Leu Asp Ser Ala Ser Arg Phe Met Ala Tyr His Lys Pro Leu Lys	1070	1075	1080	3308
aac tca cag gat tac aca gaa gct ctg cgg gca gct cga gag ctg Asn Ser Gln Asp Tyr Thr Glu Ala Leu Arg Ala Ala Arg Glu Leu	1085	1090	1095	3353
gca gcc aac atc act gct gac ctg cgg aaa gtg cct gga aca gac Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys Val Pro Gly Thr Asp	1100	1105	1110	3398

ccg	gct	ttt	gag	gtc	ttc	ccc	tac	acg	atc	acc	aat	gtg	ttt	tat	3443
Pro	Ala	Phe	Glu	Val	Phe	Pro	Tyr	Thr	Ile	Thr	Asn	Val	Phe	Tyr	
1115					1120					1125					
gag	cag	tac	ctg	acc	atc	ctc	cct	gag	ggg	ctc	ttc	atg	ctc	agc	3488
Glu	Gln	Tyr	Leu	Thr	Ile	Leu	Pro	Glu	Gly	Leu	Phe	Met	Leu	Ser	
1130					1135					1140					
ctc	tgc	ctt	gtg	ccc	acc	ttc	gct	gtc	tcc	tgc	ctc	ctg	ctg	ggc	3533
Leu	Cys	Leu	Val	Pro	Thr	Phe	Ala	Val	Ser	Cys	Leu	Leu	Leu	Gly	
1145					1150					1155					
ctg	gac	ctg	cgc	tcc	ggc	ctc	ctc	aac	ctg	ctc	tcc	att	gtc	atg	3578
Leu	Asp	Leu	Arg	Ser	Gly	Leu	Leu	Asn	Leu	Leu	Ser	Ile	Val	Met	
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atc	ctc	gtg	gac	act	gtc	ggc	ttc	atg	gcc	ctg	tgg	ggc	atc	agt	3623
Ile	Leu	Val	Asp	Thr	Val	Gly	Phe	Met	Ala	Leu	Trp	Gly	Ile	Ser	
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Tyr	Asn	Ala	Val	Ser	Leu	Ile	Asn	Leu	Val	Ser	Ala	Val	Gly	Met	
1190					1195					1200					
tct	gtg	gag	ttt	gtg	tcc	cac	att	acc	cgc	tcc	ttt	gcc	atc	agc	3713
Ser	Val	Glu	Phe	Val	Ser	His	Ile	Thr	Arg	Ser	Phe	Ala	Ile	Ser	
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Thr	Lys	Pro	Thr	Trp	Leu	Glu	Arg	Ala	Lys	Glu	Ala	Thr	Ile	Ser	
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atg	gga	agt	gcf	gtg	ttt	gca	ggf	gtg	gcc	atg	acc	aac	ctg	cct	3803
Met	Gly	Ser	Ala	Val	Phe	Ala	Gly	Val	Ala	Met	Thr	Asn	Leu	Pro	
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Gly	Ile	Leu	Val	Leu	Gly	Leu	Ala	Lys	Ala	Gln	Leu	Ile	Gln	Ile	
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Phe	Phe	Phe	Arg	Leu	Asn	Leu	Leu	Ile	Thr	Leu	Leu	Gly	Leu	Leu	
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cat	ggc	ttg	gtc	ttc	ctg	ccc	gtc	atc	ctc	agc	tac	gtg	ggg	cct	3938
His	Gly	Leu	Val	Phe	Leu	Pro	Val	Ile	Leu	Ser	Tyr	Val	Gly	Pro	
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Asp	Val	Asn	Pro	Ala	Leu	Ala	Leu	Glu	Gln	Lys	Arg	Ala	Glu	Glu	
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Ala	Val	Ala	Ala	Val	Met	Val	Ala	Ser	Cys	Pro	Asn	His	Pro	Ser	
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cga	gtc	tcc	aca	gct	gac	aac	atc	tat	gtc	aac	cac	agc	ttt	gaa	4073
Arg	Val	Ser	Thr	Ala	Asp	Asn	Ile	Tyr	Val	Asn	His	Ser	Phe	Glu	
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Gly Ser Ile Lys Gly Ala Gly Ala Ile Ser Asn Phe Leu Pro Asn	
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aat ggg cgg cag ttc tga tacagccaga ggccctgtct aggctctatg	4166
Asn Gly Arg Gln Phe	
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Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser
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Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg
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Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg
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Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu
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Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg
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Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr
 115 120 125

Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln
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Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr
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Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg
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Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp
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Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu
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Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val
 225 230 235 240

Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys
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Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu
 260 265 270

Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile

275

280

285

Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly
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Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys
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Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu
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Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro
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Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala
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Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser
370 375 380

Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His
385 390 395 400

Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn
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Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe
420 425 430

Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln
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Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn
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465 470 475 480

Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn
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Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln
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Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala
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Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala
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Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys
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Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu
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Asn Asn Tyr Pro Ala Gly Asp Pro Arg Leu Ala Gln Ala Lys Leu Trp
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Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala
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Gly Met Phe Gln Val Thr Phe Met Ala Glu Arg Ser Leu Glu Asp Glu
610 615 620

Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr
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Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser
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Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly
660 665 670

Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser
675 680 685

Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe
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Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu
705 710 715 720

Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile
725 730 735

Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu
740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala
755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe
770 775 780

Leu Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys
785 790 795 800

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820 825 830

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Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met
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Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp
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Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val
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Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser
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Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe
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Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser
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Tyr Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp
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Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys
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Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn
980 985 990

Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe
995 1000 1005

His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys
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Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu
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Arg Leu Glu Tyr Ser Gly Thr Ile Ser Ala His Cys Asn Leu Tyr
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Tyr Glu Gln Tyr Leu Thr Ile Leu Pro Glu Gly Leu Phe Met Leu
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Gly Leu Asp Leu Arg Ser Gly Leu Leu Asn Leu Leu Ser Ile Val
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Ser Met Gly Ser Ala Val Phe Ala Gly Val Ala Met Thr Asn Leu

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Pro Gly Ile Leu Val Leu Gly Leu Ala Lys Ala Gln Leu Ile Gln
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Leu His Gly Leu Val Phe Leu Pro Val Ile Leu Ser Tyr Val Gly
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Pro Asp Val Asn Pro Ala Leu Ala Leu Glu Gln Lys Arg Ala Glu
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Ser Arg Val Ser Thr Ala Asp Asn Ile Tyr Val Asn His Ser Phe
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